

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-120947

(43)Date of publication of application : 12.05.1995

(51)Int.Cl.

G03G 5/06

(21)Application number : 05-286178

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(22)Date of filing : 22.10.1993

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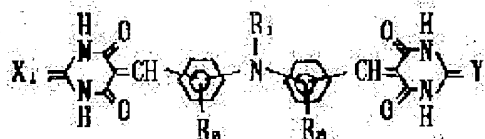
SENOO AKIHIRO

(54) ELECTROPHOTOGRAPHIC PHOTORECEPTOR AND ELECTROPHOTOGRAPHIC DEVICE

(57)Abstract:

PURPOSE: To obtain a high durability electrophotographic photoreceptor having practically high sensitivity characteristics, low photomemory and stable potential characteristics at the time of repeated use by incorporating a specified compd. into a photosensitive layer.

CONSTITUTION: In an electrophotographic photoreceptor with a photosensitive layer on the electric conductive substrate, a compd. represented by the formula is incorporated into the photosensitive layer. In the formula, each of X1 and Y1 is O or S, R1 is H, an alkyl which may have a substituent or an acyl which may have a substituent and each of R2 and R3 is H, a halogen, nitro or cyano. The form of the photosensitive layer may be any known form but the photosensitive layer is especially preferably a function separated photosensitive layer formed by laminating a layer contg. the compd. represented by the formula as an electric charge generating layer and an electric charge transferring layer contg. an electric charge transferring material.



LEGAL STATUS

[Date of request for examination] 04.12.1998

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number] 3145846

[Date of registration] 05.01.2001

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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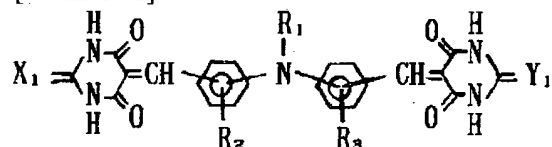
CLAIMS

[Claim(s)]

[Claim 1] An electrophotography photo conductor characterized by a sensitization layer containing a compound shown by the following general formula (1) in an electrophotography photo conductor which has a sensitization layer on a conductive base material.

A general formula (1)

[Formula 1]

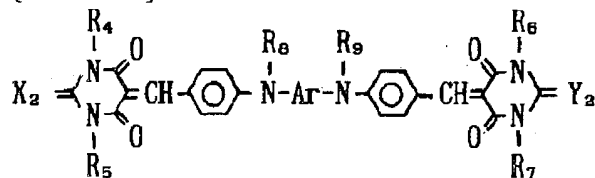


X1 and Y1 express an oxygen atom or a sulfur atom among a formula, and it is R1. The acyl group which may have the alkyl group which may have a hydrogen atom and a substituent, or a substituent is expressed, and it is R2 and R3. A hydrogen atom, a halogen atom, a nitro group, or a cyano group is expressed.

[Claim 2] An electrophotography photo conductor characterized by a sensitization layer containing a compound shown by the following general formula (2) in an electrophotography photo conductor which has a sensitization layer on a conductive base material.

A general formula (2)

[Formula 2]



X2 and Y2 express an oxygen atom or a sulfur atom among a formula, and it is R4 -R9. Expressing the phenyl group which may have the aralkyl radical or substituent which may have a hydrogen atom, the alkyl group which may have a substituent, the acyl group which may have a substituent, and a substituent, Ar expresses the heterocycle radical which may have the aromatic series radical or substituent which may have a substituent.

[Claim 3] Electrophotography equipment characterized by having a means to imprint an electrophotography photo conductor according to claim 1, electrostatic latent-image means forming, a means to develop a formed electrostatic latent image, and a developed image, to imprint material.

[Claim 4] Electrophotography equipment characterized by having a means to imprint an electrophotography photo conductor according to claim 2, electrostatic latent-image means forming, a means to develop a formed electrostatic latent image, and a developed image, to imprint material.

[0001]

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[Industrial Application] This invention relates to an electrophotography photo conductor and electrophotography equipment.

[0002]

[Description of the Prior Art] Conventionally, as an electrophotography photo conductor, inorganic photoconductivity material, such as a selenium, a cadmium sulfide, and a zinc oxide, was used widely. On the other hand, they are the photoconductivity polymer represented by Poly N-vinylcarbazole as an electrophotography photo conductor using organic photoconductivity material, and 2 and 5-screw (p-diethylaminophenyl). - 1, 3, the thing using low-molecular organic photoconductivity material like 4-OKISA diazo-RU, the thing that combined organic photoconductivity material, and this various colors and pigment are known further. Since the electrophotography photo conductor using organic photoconductivity material is good and membrane formation nature can produce it by coating, it has the advantage which can offer an electrophotography photo conductor with it. [high productivity and] [very cheap] Moreover, by selection of a color, a pigment, etc. to be used, it had the advantage with color sensitivity controllable free, and a broad examination has so far been made. The improvement remarkable in the sensitivity and endurance which carried out the laminating of the charge generating layer which especially contained the organic photoconductivity color and the pigment recently, and the charge transportation layer containing photoconductivity polymer or low-molecular organic photoconductivity material and which were made the defect of the conventional organic electrophotography photo conductor by development of a functional discrete-type photo conductor has been made.

[0003] As a material in which these photoconductivities are shown, barbiturates or a thiobarbituric acid derivative indicated by an azo pigment and JP,57-119355,A, for example is well-known. However, the electrophotography photo conductor using the barbiturates or the thiobarbituric acid derivative indicated by a conventional disazo pigment and conventional JP,57-119355,A cannot say it as thing sufficient with the noodle of sensitivity or the potential stability at the time of repeat use, but only few materials are put in practical use. Moreover, although it was practical enough compared with the conventional electrophotography photo conductor with sensitivity and the potential stability at the time of repeat use good [the electrophotography photo conductor using the barbiturates and the thiobarbituric acid derivative which are indicated by JP,3-12660,A], they were not sensitivity and the thing satisfied not necessarily in respect of photograph memory -.

[0004]

[Problem(s) to be Solved by the Invention] high [which has that the purpose of this invention offers a new electrophotography photo conductor, a practical high sensitivity property, and the potential property in which it was small stabilized at the time of repeat use by photograph memory -] -- it is offering the electrophotography photo conductor which has the potential property by which it was stabilized at the time of

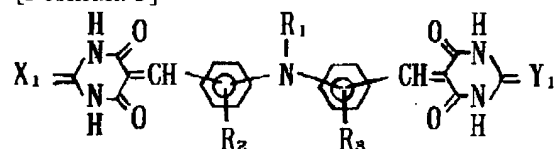
durability electrophotography photo conductor repeat use, and offering electrophotography equipment equipped with this electrophotography photo conductor.

[0005]

[Means for Solving the Problem] This invention consists of electrophotography photo conductors characterized by a sensitization layer containing a compound shown by the following general formula (1) in an electrophotography photo conductor which has a sensitization layer on a conductive base material.

General formula (1)

[Formula 3]



X1 and Y1 express an oxygen atom or a sulfur atom among a formula, and it is R1. The acyl group which may have the alkyl group which may have a hydrogen atom and a substituent, or a substituent is expressed, and it is R2 and R3. A hydrogen atom, a halogen atom, a nitro group, or a cyano group is expressed.

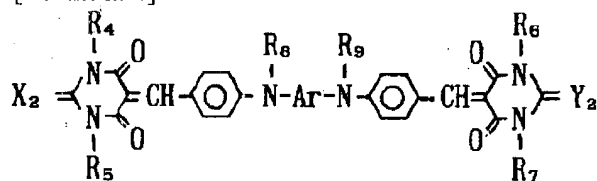
[0006] It sets to a general formula (1) and is R1. If it is an example of the alkyl group which can be set, as an example of radicals, such as methyl, ethyl, and propyl, and an acyl group, a fluorine atom, a chlorine atom, a bromine atom, and an iodine atom are mentioned as an example of radicals, such as acetyl and benzoyl, and a halogen atom.

[0007] Moreover, as a substituent which may have the above-mentioned radical, halo methyl groups, such as alkylamino radicals, such as acyl groups, such as alkyl groups, such as methyl, ethyl, and propyl, a halogen atom, acetyl, and benzoyl, dimethylamino, and diethylamino, a phenylcarbamoyl radical, a nitro group, a cyano group, and trifluoromethyl, etc. are mentioned.

[0008] Moreover, this invention consists of electrophotography photo conductors characterized by a sensitization layer containing the compound shown by the following general formula (2) in the electrophotography photo conductor which has a sensitization layer on a conductive base material.

General formula (2)

[Formula 4]



X2 and Y2 express an oxygen atom or a sulfur atom among a formula, and it is R4 -R9. Expressing the phenyl group which may have the aralkyl radical or substituent which may have a hydrogen atom, the alkyl group which may have a substituent, the acyl group which may have a substituent, and a substituent, Ar expresses the heterocycle radical which may have the aromatic series radical or substituent which may have a substituent.

[0009] It sets to a general formula (2) and is R4 -R9. As an example of the alkyl group which can be set, methyl, As an example of radicals, such as ethyl and propyl, and an aralkyl radical, benzyl, Radicals, such as phenethyl, are mentioned and as an example of the aromatic series radical in Ar, and a heterocycle radical Benzene, Naphthalene, a biphenyl, a fluorene, phenanthrene, an anthracene, aromatic hydrocarbon, such as a pyrene, a benzophenone, and full -- me -- aromatic ketone rings, such as non and benzo anthrone, -- Radicals, such as aromatic series thioketone rings and those dicyanomethylene derivatives, a furan, a thiophene, a pyridine, Indore, benzothiazole, a carbazole, acridone, a dibenzo thiophene, benzo oxazole, OKISA diazo-RU, and a thiazole, are mentioned.

[0010] Moreover, as a substituent which the above-mentioned radical may have, halo methyl groups, such as alkylamino radicals, such as acyl groups, such as halogen atoms, such as alkyl groups, such as methyl, ethyl, and propyl, a fluorine, chlorine, a bromine, and iodine, acetyl, and benzoyl, dimethylamino, and diethylamino, a phenylcarbamoyl radical, a nitro group, a cyano group, and trifluoromethyl, etc. are mentioned.

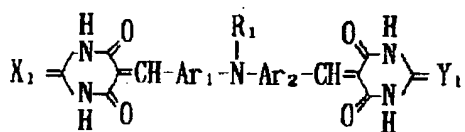
[0011] Although the example of representation of the barbiturates which are the compounds shown in tables 1-10 by the general formula (1) and (2), and a thiobarbituric acid derivative is hung up, the material used for this invention is not limited to these.

[0012] Suppose the publication of each example of a compound in a table that the structure of each example of a compound is shown by omitting the publication of the whole example structure of a compound, hanging up each prototype of the compound shown by the general formula (1) and (2), and showing the structure of only a portion of changing, in each example of a compound. In addition, in the prototype 1 in which the compound shown by the general formula (1) is shown, the portion of the radical which may have as a substituent R2 and R3 in the compound shown by the general formula (1) is expressed as Ar1 and Ar2, respectively.

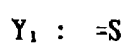
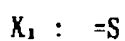
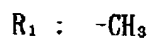
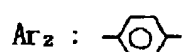
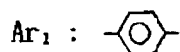
[0013]

[A table 1]

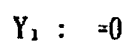
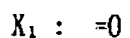
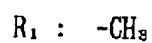
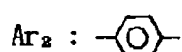
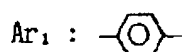
基本型 1



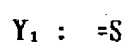
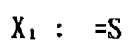
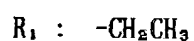
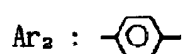
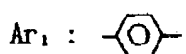
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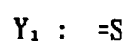
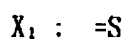
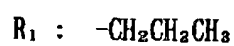
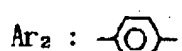
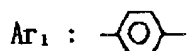
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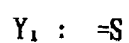
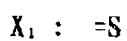
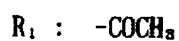
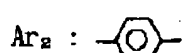
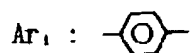
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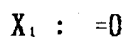
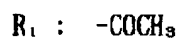
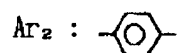
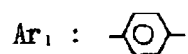


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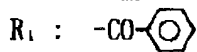
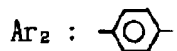
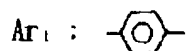


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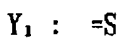
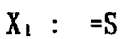
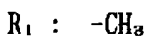
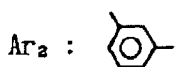
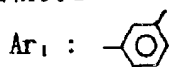
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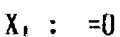
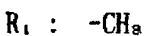
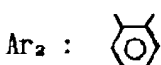
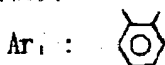
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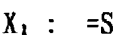
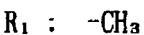
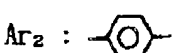
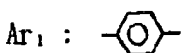
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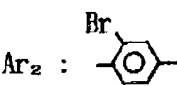
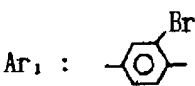
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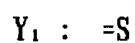
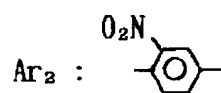
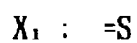
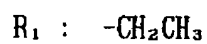
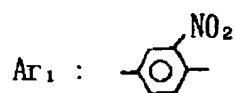


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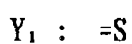
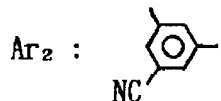
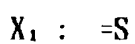
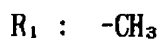
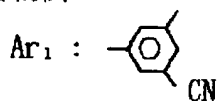


[A table 3]

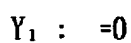
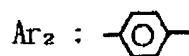
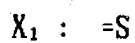
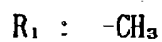
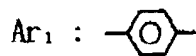
化合物例 1 2



化合物例 1 3



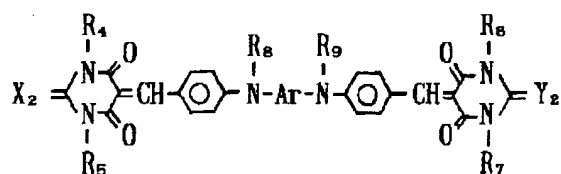
化合物例 1 4



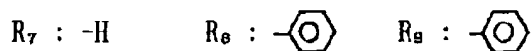
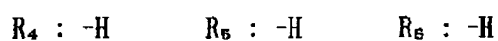
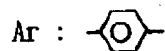
[0014]

[A table 4]

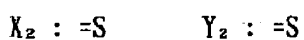
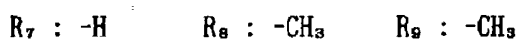
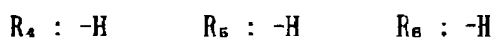
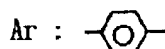
基本型 2



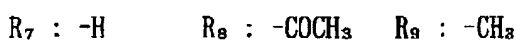
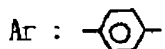
化合物例 1 5



化合物例 1 6

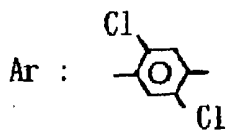


化合物例 1 7



[A table 5]

化合物例 18

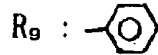
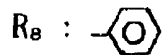


R₄ : -CH₃

R₅ : -H

R₆ : -CH₃

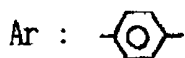
R₇ : -H



X₂ : =S

Y₂ : =S

化合物例 19



R₄ : -H

R₅ : -H

R₆ : -H

R₇ : -H



X₂ : =O

Y₂ : =O

化合物例 20



R₄ : -H

R₅ : -H

R₆ : -H

R₇ : -H

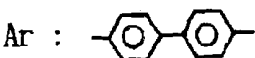
R₈ : -CH₃

R₉ : -CH₃

X₂ : =O

Y₂ : =O

化合物例 21

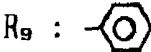
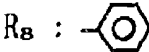


R₄ : -H

R₅ : -H

R₆ : -H

R₇ : -H

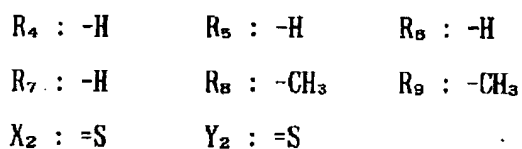
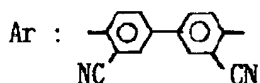


X₂ : =S

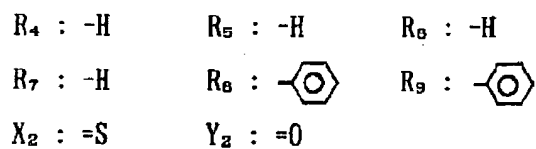
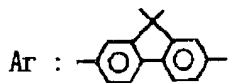
Y₂ : =S

[A table 6]

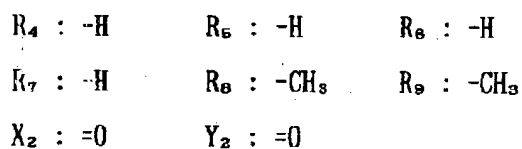
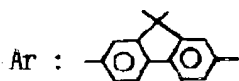
化合物例 2 2



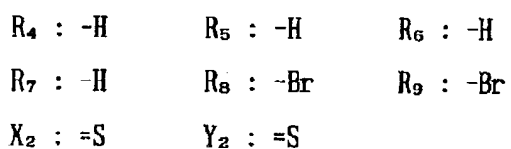
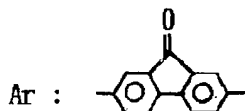
化合物例 2 3



化合物例 2 4

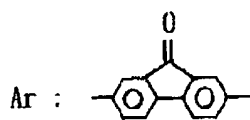


化合物例 2 5



[A table 7]

化合物例 2 6

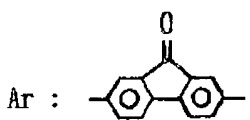


R₄ : -H R₅ : -H R₆ : -H

R₇ : -H R₈ : -CH₂CH₃ R₉ : -CH₂CH₃

X₂ : =S Y₂ : =S

化合物例 2 7

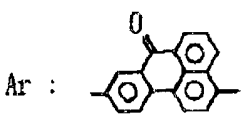


R₄ : R₅ : -H R₆ :



R₇ : -H R₈ :  R₉ : 

X₂ : =O Y₂ : =O

化合物例 2 8



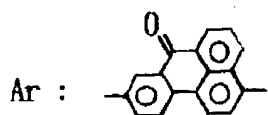
R₄ : -H R₅ : -H R₆ : -H

R₇ : -H R₈ :  R₉ : 

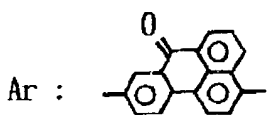
X₂ : =S Y₂ : =S

[A table 8]

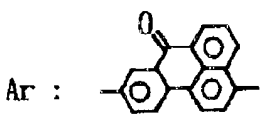
化合物例 29

R₄ : -HR₅ : -HR₆ : -HR₇ : -HR₈ : -CH₃R₉ : -CH₃X₂ : =SY₂ : =S

化合物例 30

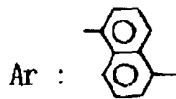
R₄ : -HR₅ : -HR₆ : -HR₇ : -HR₈ : R₉ : X₂ : =SY₂ : =S

化合物例 31

R₄ : -CH₃R₅ : -CH₃R₆ : -CH₃R₇ : -CH₃R₈ : -CH₃R₉ : -CH₃X₂ : =OY₂ : =O

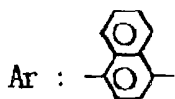
[A table 9]

化合物例 3 2



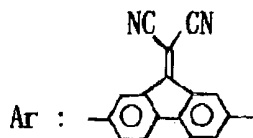
$R_4 : -H$ $R_5 : -H$ $R_6 : -H$
 $R_7 : -H$ $R_8 : -CH_3$ $R_9 : -CH_3$
 $X_2 : =S$ $Y_2 : =S$

化合物例 3 3



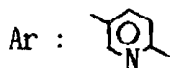
$R_4 : -H$ $R_5 : -H$ $R_6 : -H$
 $R_7 : -H$ $R_8 : -C_6H_4NO_2$ $R_9 : -C_6H_4NO_2$
 $X_2 : =S$ $Y_2 : =S$

化合物例 3 4



$R_4 : -H$ $R_5 : -H$ $R_6 : -H$
 $R_7 : -H$ $R_8 : -CH_3$ $R_9 : -CH_3$
 $X_2 : =S$ $Y_2 : =S$

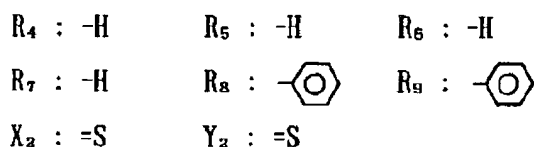
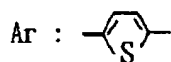
化合物例 3 5



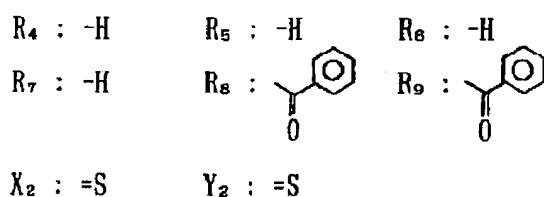
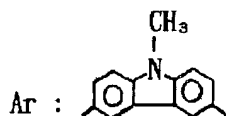
$R_4 : -H$ $R_5 : -H$ $R_6 : -H$
 $R_7 : -H$ $R_8 : -CH_2CH_3$ $R_9 : -CH_2CH_3$
 $X_2 : =S$ $Y_2 : =S$

[A table 10]

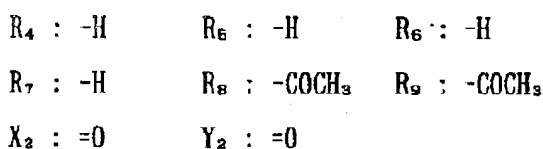
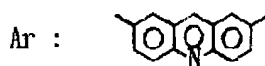
化合物例 3 6



化合物例 3 7

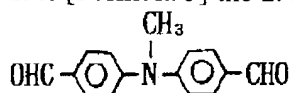


化合物例 3 8



[0015] The synthetic example 1 (composition of the example 1 of a compound)

It is [Formula 5] the 2.4g of the following aldehyde compounds to a 100ml eggplant flask.



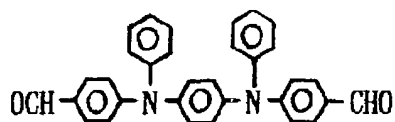
2.9g [of thiobarbituric acid] and ethanol 60ml was added, and heating churning was performed at 70 degrees C for 6 hours. Carried out cooling backward filtration of the obtained reaction mixture to 50 degrees C, it was made to dry after ethanol washing, and the compound of the example 1 of a compound was obtained. Yield of 4.2g.

元素分析値

	計算値 (%)	実測値 (%)
C	56.35	56.20
H	3.44	3.49
N	14.28	14.25

[0016] The synthetic example 2 (composition of the example 15 of a compound)

It is [Formula 6] the 2.3g of the following aldehyde compounds to a 100ml eggplant flask.



1.4g [of thiobarbituric acid] and ethanol 60ml was added, and heating churning was performed at 70 degrees C for 6 hours. Carried out cooling backward filtration of the obtained reaction mixture to 50 degrees C, it was made to dry after ethanol washing, and the compound of the example 15 of a compound was obtained. Yield of 3.2g.

元素分析値

	計算値 (%)	実測値 (%)
C	66.93	66.65
H	3.89	3.92
N	11.57	11.66

[0017] The electrophotography photo conductor of this invention has a sensitization layer containing the compound shown by the general formula (1) or (2) on a conductive base material. Although the gestalt of a sensitization layer may be what kind of well-known gestalt, especially the sensitization layer of the functional discrete type which used as the charge generating layer the layer containing the compound shown by the general formula (1) or (2), and carried out the laminating of the charge transportation layer which contains charge transportation material in this is desirable.

[0018] A charge generating layer can form the spreading liquid which distributed the compound shown by the general formula (1) or (2) with binder resin in the suitable solvent by applying by the well-known method on a conductive base material, and, as for the thickness, it is preferably desirable to consider as a 0.1-1-micrometer thin film layer 5 micrometers or less.

[0019] In this case, the binder resin used is the polyvinyl butyral which is not replaced [substitute or], polyvinyl benzal, and polyarylate, although chosen from extensive insulating resin or organic photoconductivity polymer. A polycarbonate, polyester, phenoxy resin, cellulosic resin, acrylic resin, polyurethane, etc. are desirable, and halogen atoms, such as a fluorine and a bromine, an alkyl group, an alkoxy group, a nitro group, a trifluoromethyl radical, a cyano group, etc. are desirable as a substituent. Moreover, the amount of the binder resin used is 40 or less % of the weight preferably 80 or less % of the weight in the content in a charge generating layer.

[0020] Moreover, it is desirable to choose from what the solvent to be used dissolves the aforementioned resin and does not dissolve a below-mentioned charge transportation layer or a below-mentioned under-coating layer. Specifically, aliphatic hydrocarbon compounds, such as alcohols, such as aromatic hydrocarbon compounds, such as ester, such as amides, such as ketones, such as ether, such as a tetrahydrofuran and 1,4-dioxane, a cyclohexanone, and a methyl ethyl ketone, and N.N-dimethylformamide, methyl acetate, and ethyl acetate, toluene, a xylene, and mono-chlorobenzene, a methanol, ethanol, and 2-propanol, chloroform, and a methylene chloride, etc. are mentioned.

[0021] The laminating of the charge transportation layer is carried out on a charge generating layer or to the bottom, and it has the function to convey reception and this for a charge carrier from the bottom charge generating layer of existence of electric field. A charge transportation layer is formed by dissolving and applying charge transportation material into a solvent with suitable binder resin if needed, and, generally the thickness has preferably desirable 15-30 micrometers 5-40 micrometers.

[0022] Charge transportation material has electronic transportation material and electron hole transportation material. As electronic transportation material 7-tetra-nitroglycerine full ORENON for example, 2, 4, and 7-trinitro full -- me -- non, and 2, 4 and 5 -- What macromolecule-ized electronic suction nature material, such

as chloranil and tetracyano quinodimethan, and these electronic suction nature material is mentioned. As electron hole transportability material, polynuclear aromatic compounds, such as a pyrene and an anthracene, A carbazole, Indore, an imidazole, oxazole, a thiazole, Heterocyclic compounds, such as OKISA diazo-RU, a pyrazole, pyrazoline, thiadiazole, and a triazole system compound, p-diethylamino benzaldehyde N, N-diphenyl hydrazone, Hydrazone system compounds, such as N and an N-diphenyl hydrazino-3-methylidyne-9-ethyl carbazole, Styryl system compounds, such as alpha-phenyl-4'-N and N-diphenylamino stilbene and a 5-[4-(G p-tolylamino) benzyldiene]-5H-dibenzo [a, d] cyclo heptene, The polymer (for example, Polly N-vinylcarbazole, a polyvinyl anthracene, etc.) which has a benzidine system compound, a triaryl methane system compound, a triphenylamine, or the radical that consists of these compounds in a principal chain or a side chain is mentioned. Inorganic materials, such as a selenium, a SEREN tellurium, an amorphous silicon, and a cadmium sulfide, can also be used besides such organic charge transportation material. moreover, such charge transportation material -- one sort -- or two or more sorts can be combined and it can use.

[0023] When charge transportation material does not have membrane formation nature, a suitable binder can be used, and specifically, organic photoconductivity polymer, such as insulating resin, such as acrylic resin, polyarylate, polyester, a polycarbonate, polystyrene, an acrylonitrile styrene copolymer, polyacrylamide, a polyamide, and chlorinated rubber, or Polly N-vinylcarbazole, and a polyvinyl anthracene, etc. is mentioned.

[0024] As a conductive base material with which a sensitization layer is formed, aluminum, an aluminium alloy, copper, zinc, stainless steel, vanadium, molybdenum, chromium, titanium, nickel, an indium, gold, platinum, etc. are used, for example. Moreover, the base material which sank into plastics or paper the base material or the conductive particle which covered the plastics which carried out coat formation of such a metal or an alloy with the vacuum deposition method, and conductive particles (for example, polyethylene, polypropylene, a polyvinyl chloride, polyethylene terephthalate, acrylic resin, etc.) (for example, carbon black, a silver granule child, etc.) on plastics or a metal substrate with suitable binder resin can be used.

[0025] An under-coating layer with a barrier function and an adhesion function can also be prepared in the middle of a conductive base material and a sensitization layer. 0.1-3 micrometers 5 micrometers or less are preferably suitable for the thickness of an under-coating layer. An under-coating layer can be formed with casein, polyvinyl alcohol, a nitrocellulose, polyamides (nylon 6, Nylon 66, Nylon 610, copolyamide, alkoxy methylation nylon, etc.), polyurethane, an aluminum oxide, etc.

[0026] The electrophotography photo conductor which made the same layer contain the compound shown by the general formula (1) or (2) and charge transportation material as another example of this invention can be mentioned. On a conductive base material, spreading desiccation of the electrophotography photo conductor of this example can be carried out, and it can form the compound shown by the general formula (1) or (2), and the liquid which distributed charge transportation material in the suitable resin solution.

[0027] Also in which electrophotography photo conductor, the crystal form of the compound shown by the general formula (1) used or (2) may be amorphous, you may be a crystalline substance, and it is also possible to use the compound shown by the general formula (1) or (2) if needed combining charge generating material well-known in combining two or more kinds.

[0028] It not only uses the electrophotography photo conductor of this invention for an electrophotography copying machine, but it can use it for electrophotography applicable fields, such as a laser beam printer, a CRT printer, an LED printer, a liquid crystal printer, laser platemaking, and facsimile, widely.

[0029] Moreover, this invention consists of electrophotography equipment characterized by having a means to imprint the electrophotography photo conductor of said this invention, electrostatic latent-image means forming, a means to develop the formed electrostatic latent image, and the developed image, to imprint material.

[0030] The outline configuration of the common imprint type electrophotography equipment which used the drum-type photo conductor of this invention for drawing 1 was shown. In drawing, 1 is a drum-type photo conductor as image support, and a rotation drive is carried out with a predetermined peripheral velocity in the

direction of an arrow head a center [shaft 1a]. This photo conductor 1 receives homogeneity electrification of positive or negative predetermined potential in the peripheral surface with the electrification means 2 in the rotation process, and, subsequently the light figure exposure L is received with an image exposure means by which it does not illustrate, in the exposure section 3 (slit exposure, laser beam scan exposure, etc.). Thereby, sequential formation of the electrostatic latent image corresponding to an exposure image is carried out at the photo conductor peripheral surface. Subsequently toner development of the electrostatic latent image is carried out with the development means 4, and the sequential imprint is carried out in the field of the imprint material P which the toner development image synchronization-picked with rotation of a photo conductor 1 between the photo conductor 1 and the imprint means 5 from the non-illustrated feed section with the imprint means 5, and was fed with it. The carrier beam imprint material P is separated from a photo conductor side, it is introduced to the image fixing means 8, and an image imprint is printed out as a duplication (copy) in response to image fixing outside the plane. In response to removal of the imprint remaining toner, a clarification side is formed with the cleaning means 6, electric discharge processing is carried out by the pre-exposure means 7, and the surface of the photo conductor 1 after an image imprint is repeatedly used for image formation. Generally as a homogeneity electrification means 2 of a photo conductor 1, corona-electrical-charging equipment is used widely. Moreover, generally the corona-transfer means is widely used also for imprint equipment 5. As electrophotography equipment, it may combine with one, and may constitute by making two or more things into an equipment unit among components, such as an above-mentioned photo conductor, and a development means, a cleaning means, and this unit may be constituted free [attachment and detachment] to the main part of equipment. For example, a photo conductor 1 and the cleaning means 6 may be unified, it may consider as one equipment unit, and you may make it the configuration which can be detached and attached freely using guidance means, such as a rail of the main part of equipment. At this time, you may constitute with an electrification means and/or a development means in the way of the above-mentioned equipment unit. Moreover, when using electrophotography equipment as a copying machine or a printer, or the light figure exposure L uses the reflected light and the transmitted light from a manuscript, it is performed by reading a manuscript and performing the scan of a laser beam, the drive of a light emitting diode array, or the drive of a liquid crystal shutter-array with this signal according to signal-izing.

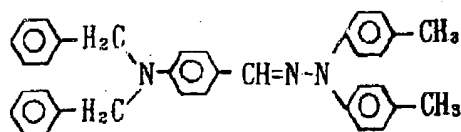
[0031]

[Example]

On the example 1 - 6 aluminum substrate, the liquid which dissolved methoxymethyl-ized-nylon (average molecular weight 32000) 5g and 10g (average molecular weight 29000) of alcoholic fusibility copolyamides in methanol 95g was applied with the Mayer bar, and the under-coating layer whose thickness after desiccation is 1 micrometer was formed.

[0032] Next, in addition to the liquid which melted 2g (whenever [butyral-ized] 63-mol %) of butyral resin, 5g of compounds of the aforementioned example 1 of a compound was distributed by the sand mill to cyclohexanone 95g for 20 hours. It applied with the Mayer bar and the charge generating layer was formed so that the thickness after drying these dispersion liquid on an under-coating layer might be set to 0.20 micrometers.

[0033] Subsequently, it is [Formula 7] 5g of hydrazone compounds which have the following structure expression.

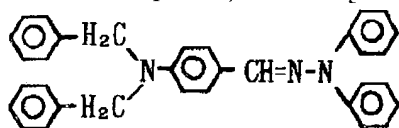


Polymethylmethacrylate (number average molecular weight 100000) 5g was dissolved in mono-chlorobenzene 40g, it applied with the Mayer bar and the charge transportation layer was formed so that the thickness after

drying this liquid on a charge generating layer might be set to 20 micrometers, and the electrophotography photo conductor was created. Let this be a photo conductor 1.

[0034] The electrophotography photo conductor [replaced with the example 1 of a compound, and used the compound of the examples 2, 4, 5, 7 10, 12, and 14 of a compound, and also] corresponding to examples 2-8 was created completely like the example 1. It considers as photo conductors 2-8, respectively.

[0035] In nine to example 14 example 1, the thickness of a charge generating layer is formed so that it may be set to 0.15 micrometers, the hydrazone compound which has the following structure expression is used [it replaces with the example 1 of a compound, and] using the compound of the examples 15, 16, 17, 22, 25, and 35 of a compound, and it is [Formula 8].



The electrophotography photo conductor [formed the thickness of a charge transportation layer so that it might be set to 17 micrometers, and also] corresponding to examples 9-14 was created completely like the example 1. It considers as photo conductors 9-14, respectively.

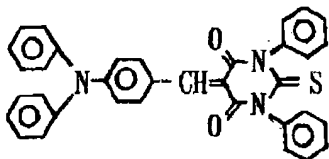
[0036] After being charged in negative and carrying out dark place neglect of the electrophotography photo conductor of photo conductors 1-14 for 1 second by -5kV corona discharge using the electrostatography paper testing device made from Kawaguchi Electrical machinery (SP-428), it exposed with light with an illuminance of 10 luxs using the halogen lamp, and the electrification property was evaluated. As an electrification property, it is surface potential V_0 . Light exposure $E_{1/2}$ It measured. [required for the surface potential after dark place neglect to decline to one half] This result is shown in a table 11.

[A table 11]

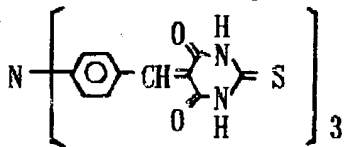
実施例	感光体	顔料例	V_0 (-V)	$E_{1/2}$ (lux·sec)
1	1	1	730	0.95
2	2	2	750	1.25
3	3	4	700	1.05
4	4	5	730	1.35
5	5	7	720	1.20
6	6	10	710	1.30
7	7	12	700	1.10
8	8	14	730	1.20
9	9	15	710	1.30
10	10	16	695	1.56
11	11	17	720	2.01
12	12	22	720	1.60
13	13	25	705	1.31
14	14	35	710	3.25

[0037] It replaced with the example 1 of a compound used in the example 1 of a comparison, and the two examples 1, the electrophotography photo conductor [used the comparison compound A shown with the following structure expression and the compound of B, and also] corresponding to the examples 1 and 2 of a comparison was created completely like the example 1, and it considered as the comparison photo conductors 1 and 2, respectively. The same method as an example 1 estimated the electrification property for these comparison photo conductors. A result is shown in a table 12.

the comparison compound A -- [Formula 9]



the comparison compound B -- [Formula 10]



[A table 12]

比較例	比較感光体	比較顔料例	V ₀ (-V)	E _{1/2} (lux·sec)
1	1	A	800	29.0
2	2	B	720	2.01

[0038] From these results, it is known that each electrophotography photo conductor of this invention has sufficient electrification ability and the outstanding sensitivity.

[0039] It stuck on the cylinder of the electrophotography copying machine equipped with the corona-electrical-charging machine of 1 - 6.5kV of 15 to example 26 photo conductors, exposure optical system, a development counter, an imprint electrification machine, electric discharge exposure optical system, and a cleaner.

[0040] Early umbra potential VD Bright section potential VL Amount **VD of fluctuation of the umbra potential at the time of setting it as the -700V and -200V neighborhood, respectively, and carrying out repeat use 5000 times Amount of fluctuation **VL of bright section potential It measured. A result is shown in a table 13. In addition, the minus sign in the amount of fluctuation of potential expresses the fall of the absolute value of potential, and a plus sign expresses the increment in the absolute value of potential.

[0041] It evaluated similarly about photo conductors 2, 4, 5, 6, 8, 9, 10, 11, 12, 13, and 14. A result is shown in a table 13.

[A table 13]

実施例	感光体	ΔV_D (V)	ΔV_L (V)
15	1	-10	0
16	2	0	+5
17	4	-5	+5
18	5	-5	+5
19	6	-10	+10
20	8	+5	+20
21	9	-5	-5
22	10	+10	-5
23	11	+15	+5
24	12	-10	-10
25	13	0	+5
26	14	+20	+15

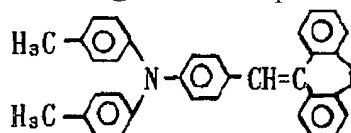
[0042] The amount of potential fluctuation at the time of repeat use was measured [in / for the example 3 of a comparison, and 4 comparison photo conductors 1 and 2 / the example 15] by the same method. A result is shown in a table 14.

[A table 14]

比較例	比較感光体	ΔV_D (V)	ΔV_L (V)
3	1	-70	-20
4	2	+60	+15

[0043] It is known from the result of examples 15-26 and the examples 3 and 4 of a comparison that the electrophotography photo conductor of this invention has little potential fluctuation at the time of repeat use.

[0044] The under-coating layer of the polyvinyl alcohol which has 0.5-micrometer thickness was formed on the aluminum side of an example 27 aluminum vacuum evaporation polyethylene terephthalate film. Also in the example 1, spreading desiccation of the dispersion liquid of the compound of the same example 1 of a compound was carried out with the Mayer bar, and the charge generating layer of 0.2 micrometers of thickness was formed in besides. Subsequently, it is [Formula 11] 5g of styryl compounds which have the following structure expression.

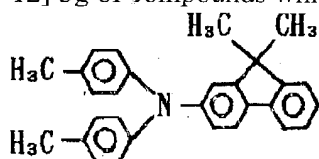


Spreading desiccation of the liquid which melted polycarbonate (weight average molecular weight 55000) 5g to tetrahydrofuran 40g was carried out on the charge generating layer, the charge transportation layer of 20 micrometers of thickness was formed, and the electrophotography photo conductor was created. It considers as a photo conductor 15.

[0045] As a coating for example 28 charge generating layers, the dispersion liquid of the example 15 of a compound in an example 9 were used, and also the electrophotography photo conductor was created like the example 27. It considers as a photo conductor 16.

[0046] About photo conductors 15 and 16, the electrification property and the durable property were measured by the same method as an example 1 and an example 15. A result is shown.

Photo conductor 15V0:+5V[0047] : -740V, E1/2 : 0.90 lux-sec**VD : -10V, **VL : 0V photo conductor 16V0 : -720V, E1/2 : 1.20 lux-sec**VD : -5V, **VL The under-coating layer of the polyvinyl alcohol which has 0.5-micrometer thickness was formed on the aluminum side of an example 29 aluminum vacuum evaporation polyethylene terephthalate film. Also in the example 5, spreading desiccation of the dispersion liquid of the compound of the same example 7 of a compound was carried out with the Mayer bar, and the charge generating layer of 0.2 micrometers of thickness was formed in besides. Subsequently, it is [Formula 12] 5g of compounds which have the following structure expression.



Spreading desiccation of the liquid which melted polycarbonate (weight average molecular weight 55000) 5g to tetrahydrofuran 40g was carried out on the charge generating layer, the charge transportation layer of 18 micrometers of thickness was formed, and the electrophotography photo conductor was created. It considers as a photo conductor 17.

[0048] As a coating for example 30 charge generating layers, using the dispersion liquid of the example 25 of a compound in an example 13, the thickness of a charge generating layer was formed so that it might be set to 25 micrometers, and also the electrophotography photo conductor was created like the example 29. It considers as a photo conductor 18.

[0049] About photo conductors 17 and 18, the electrification property and the durable property were measured by the same method as an example 1 and an example 9. A result is shown.

Photo conductor 17V0:+5V[0050] : -720V, E1/2 : 1.15 lux-sec**VD : -5V, **VL : +5V photo conductor 18V0 : -720V, E1/2 : 1.15 lux-sec**VD : -5V, **VL The charge generating layer and charge transportation layer in the electrophotography photo conductor created in the example 31 example 3 were applied in order of reverse, and also the electrophotography photo conductor was created like the example 3. Let this be a photo conductor 19. The same method as an example 1 estimated the electrification property. However, electrification was considered as positive electrification. A result is shown.

V0 :+700V, E1/2 : 1.50 lux-sec [0051] The charge generating layer and charge transportation layer in the electrophotography photo conductor created in the example 32 example 10 were applied in order of reverse, and also the electrophotography photo conductor was created like the example 10. Let this be a photo conductor 20. The same method as an example 1 estimated the electrification property. However, electrification was considered as positive electrification. A result is shown.

V0 :+710V, E1/2 : 2.05 lux-sec [0052] In example 33 example 4, it forms to a charge generating layer similarly. Non, spreading desiccation of the liquid which dissolved 5g and Polly 4, 4'-dioxy diphenyl -2, and 2-pro PANKA-BONE-TO (molecular weight 300000) 5g in tetrahydrofuran 50g is carried out with the Mayer bar. moreover -- 2, 4, and 7-trinitro-9-full -- me -- The charge transportation layer of 20 micrometers of

thickness was formed, and the electrophotography photo conductor was created. Let this be a photo conductor 21. The same method as an example 1 estimated the electrification property. However, electrification was considered as positive electrification. A result is shown.

V0 :+690V, E1/2 : 1.70 lux-sec [0053] In example 34 example 12, it forms to a charge generating layer similarly. Non, spreading desiccation of the liquid which dissolved 5g and Polly 4, 4'-dioxy diphenyl -2, and 2-pro PANKA-BONE-TO (molecular weight 300000) 5g in tetrahydrofuran 50g is carried out with the Mayer bar. moreover -- 2, 4, and 7-trinitro-9-full -- me -- The charge transportation layer of 18 micrometers of thickness was formed, and the electrophotography photo conductor was created. Let this be a photo conductor 22. The same method as an example 1 estimated the electrification property. However, electrification was considered as positive electrification. A result is shown.

V0 :+680V, E1/2 : 3.15 lux-sec [0054] Cyclohexanone 9.5g and a paint shaker distributed 0.5g of compounds of the example 9 of example 35 compound for 5 hours. 5g of charge transportation material used in the example 1 and the liquid which melted polycarbonate 5g to tetrahydrofuran 40g were added here, and it shook for further 1 hour. Spreading desiccation of the prepared spreading liquid was carried out with the Mayer bar on the aluminum substrate, the sensitization layer of 19 micrometers of thickness was formed, and the electrophotography photo conductor was created. Let this be a photo conductor 23. The same method as an example 1 estimated the electrification property. However, electrification was considered as positive electrification. A result is shown.

V0 :+720V, E1/2 : 1.75 lux-sec [0055] Cyclohexanone 9.5g and a paint shaker distributed 0.5g of compounds of the example 32 of example 36 compound for 5 hours. 5g of charge transportation material used in the example 1 and the liquid which melted polycarbonate 5g to tetrahydrofuran 40g were added here, and it shook for further 1 hour. Spreading desiccation of the prepared spreading liquid was carried out with the Mayer bar on the aluminum substrate, the sensitization layer of 19 micrometers of thickness was formed, and the electrophotography photo conductor was created. Let this be a photo conductor 24. The same method as an example 1 estimated the electrification property. However, electrification was considered as positive electrification. A result is shown.

V0 :+695V, E1/2 : 3.27 lux-sec [0056] The white fluorescent lamp was used for the electrophotography photo conductor created in the 37 to example 39 examples 1, 3, and 7, 1500 luxs light was irradiated for 5 minutes, difference **VPM with the umbra potential before irradiating the umbra potential and light 5 minutes after an exposure was measured, and photograph memory - was evaluated. A result is shown in a table 15.

[0057] The electrophotography photo conductor created in the example 5 of a comparison and the examples 1 and 2 of 6 comparisons was used, and also the same evaluation as an example 37 was performed. A result is shown in a table 15.

	感光体 (比較)	ΔV_{PM} (V)
実施例 37	1	10
〃 38	3	15
〃 39	7	10
比較例 5	1	70
〃 6	2	30

[A table 15]

[0058]

[Effect of the Invention] high [which is excellent in the potential property by which was / the electrophotography photo conductor of this invention / small, and it was stabilized at the time of repeat use] -
- the remarkable effect that a durability property is acquired is done so. [of high sensitivity property and photograph memory -] This effect is also the same as when this electrophotography photo conductor is applied to electrophotography equipment.

[Translation done.]